

Impact of Exchange Rate Depreciation on Balance of Payments: Empirical Evidence from Sri Lanka

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Introduction

Exchange rate is a fundamental macroeconomic variable that has various impacts on balance of payments as well as other macroeconomic variables (Odili, 2014). Exchange rate plays a major role in the international economic integration because all nations are not hold autarky equilibrium so they are holding an international economic relation with other countries (Oladipupo and Onataniyohuwo, 2011). Exchange rate refers to the price of one currency in terms of another foreign currency. Sri Lanka's exchange rate policy has gradually evolved from a fixed exchange rate regime in 1948 to an independently floating regime by 2001. Sri Lanka, which followed a managed floating exchange rate regime with crawling bands since 1977, shifted to an independently floating exchange rate regime in January 2001 due to the strong need of maintaining a large stock of international reserves (Central Bank of Sri Lanka, 2016).

The exchange rate is a key determinant of balance of payments (BOP) of the country (Oladipupo and Onataniyohuwo, 2011). Balance of Payments is a balance of international monetary transactions engaged in during a specific period of time; government, residents and non-residents individuals and institutions in the rest of the world can be involved in such transactions. In Sri Lanka, the current crisis in the BOP of the country is fundamental weaknesses in the structure and

performance of the economy over a period of time. Sri Lanka faces the BOP crisis again because current account balance remains stable but the financial account weakened with the resumption of capital out flows, inability to attract foreign investments and the country's net international foreign reserves fell short of the target and deficit trade balance which lead BOP crisis in Sri Lanka. A sound economic and financial policy is imperative to resolve the current crisis of BOP; therefore, in this study test whether exchange rate is an adoptable variable to remove this imbalance BOP situation from the country.

There are number of empirical studies have been carried out the impact of exchange rates on BOP, although with mixed results. Ahmad et al. (2014) and Odili (2014) estimated the impact of exchange rate on the BOP by using auto regressive distributed lag (ARDL) and they found exchange rate has a statistically significant and positive impact on BOP in the long-run as well as short run. However, Ontaniyohuo and Onataniyohuwo (2011) found the result which is contradictory with Ahmad et al and Odili. Iyoboyi and Muftan (2014) confirmed a long-term relationship with associated variables and bidirectional causality between BOP and other variables employed. In Sri Lanka, Alawattage (2002) examined the effectiveness of exchange rate policy of Sri Lanka and he found that there is a long-run relationship between trade balance and the real effective exchange rate.

According to the Sri Lankan data, it is difficult to identify the clear relationship between exchange rate and budget deficit. This motivated to do the quantitative assessment between these variables since the quantitative assessments between these variables are inadequate and limited in the Sri Lankan context. Therefore, this study attempts to fill this gap by investigating the impact of exchange rate on BOP position in Sri Lanka.

Objectives

The main objective of this study is to empirically analyze the impact of exchange rate depreciation on BOP in Sri Lanka.

Methodology

There are two main theories explained the behavior of exchange rate (Olidi, 2011). First, aspect of elasticity approach to BOP and exchange rate relationship is the Marshall-Lerner condition. Elasticity states that devaluation helps to improve BOP deficits of a country by increasing its exports and reducing its imports. When the sum of price elasticity of demand for exports and imports in absolute terms is equal to unity, depreciation has no effect on the BOP situation will remain unchanged ($\epsilon_x + \epsilon_m = 1$). where: ϵ_x is the demand elasticity of exports and ϵ_m is the demand elasticity for imports. The sum of price elasticity is greater than unity; depreciation will improve balance of payments ($\epsilon_x + \epsilon_m > 1$). On the other hand, if the sum of price elasticity is less than unity, depreciation will worsen on the balance of payment because which increase the burden of the balance of payment deficits ($\epsilon_x + \epsilon_m < 1$). Second, monetary approach focuses on both the current and capital accounts of the BOP (Ontaniyohuo and Onataniyohuwo (2011). In this approach also indicates the depreciation leads to correct the BOP imbalance situation. Another thought is the IS-LM model, suggest depreciation is theoretically expected to have positive effect on export and it would reduce import (Iyoboyi and Muftan, 2014).

In this study has been used the time series data gathering from World Bank and Central Bank Reports spanning from 1978 to 2015. We employed the data of balance of payment (BOP), current account (CA), exchange rate (ER), inflation (INF), lending interest rate (LIR), real gross domestic product (RGDP), inflation of USA (INFUS) and lending interest rate of USA (LIRUS). Following general specification of theoretical framework was developed by Fedderke (2002) and it was expanded by Vinayagathan and Priyatharsiny (2017) adopted to examine the above objective.

$$BOP_t = \delta_0 + \delta_1 CA_t + \delta_2 ER_t + \delta_3 INF_t + \delta_4 LIR_t + \delta_5 RGDP_t + \delta_6 INFUS_t + \delta_7 LIRUS_t + \epsilon_t \quad (1)$$

Where, ε_t is the white noise error term. Auto Regressive Distributed Lag (ARDL) co-integration technique developed by Pesaran et al. (2001) was adapted to examines the above equation. Once we confirmed the co-integrating relationship between the variables using bound testing method, then we employed error correction version of ARDL model to examine the short run relationship and long run adjustment between the variables.

Results and Discussion

The both ADF and PP unit root test approaches confirmed that none of the variables are I(2). Akaike information criterion (AIC) suggested that to use ARDL (2, 2, 2, 0, 1, 2, 0, 0) model¹ for this analysis. Our ARDL bound testing model passes the all the diagnostic testing (see Panel B in Table 1 below).

The CUSUM test concludes that the model is stable and result of Wald test suggests that there exist co-integrating relationships between the variables under considered in this study². As expected to the theory and some of the existing studies (Ahmad et al, 2014; Odili, 2014 and Iyoboyi and Muftan, 2014), the ARDL bound testing results found that ER has positive and significant impact on BOP in the long-run. Whereas CA affect positively and significantly on BOP in the long run, which implies that positive and higher balance of CA will bring BOP surplus to domestic economy but RGDP affect negatively and significantly on BOP which implies increasing RGDP encourage to rely on imports more and reduce the export activities because of the feeling of enough income (see Panel A in Table1). The error correction version of ARDL model also passes the all the diagnostic testing (see Panel B in Table 2 below) and the stability test.

¹ The best model was selected from among the top 20 models based on the AIC. However, due to the page constraint, the results are not presented but available upon request.

² The results of CUSUM and Wald test are not presented but available upon request

Table 1: The Results of Long run Relationship

Panel A: Long run Coefficients							
Cons	CA	ER	INF	LIR	RGDP	INFUS	LIRUS
	0.000001*	7245.0*	-744.2	-71.83	-0.00002*	-660.3	-2294
	(0.001)	(0.0003)	(0.6502)	(0.805)	(0.0003)	(0.8977)	(0.624)

$R^2 = 0.9555$

Panel B: Diagnostics Test

Serial Correlation (LM Test)	Prob. = 0.1125
Normality Test (Jarque-Bera)	Prob. = 0.6371
Heteroscedasticity (BPG Test)	Prob. = 0.8476
Omitted Variable (Ramsey's RESET)	Prob. = 0.8268

Note: Probability values are given in the parenthesis. * Represents the variables are statistically significant at 5 % level of significance respectively.

CA, ER and LIRUS in current values have a positive impact on BOP and CA in lag 2, ER in lag 1, LIR in current and RGDP in current, lag 1 and 2 affect BOP negatively in the short run (see Panel A in Table 2). As expected, the coefficient of ECT is significant and negative implies that the dependent variable can get back to long run steady state line at the speed of 99.2 % in each year one period after the exogenous shocks.

Table 2: The Results of ECM-ARDL (3, 4, 4, 4, 1, 4) Model

Panel A: Short run Coefficients			
Variables	Lag order		
	0	1	2
ΔBOP		-0.721 (0.1729)	1.489^{**} (0.0000)
ΔCA	0.00000038^{**} (0.0049)	-0.0000003 (0.5154)	-0.000002^{**} (0.0000)
ΔER	7198.1^{**} (0.0270)	-6008.9^{**} (0.0157)	3336.8 (0.1454)
ΔINF	-446.6 (0.7154)		
ΔLIR	-14926.9^{**} (0.0141)	4628.4 (0.3038)	
$\Delta RGDP$	-0.00004^{**} (0.0026)	-0.00006^{**} (0.0001)	-0.00002^{*} (0.0597)
$\Delta INFUS$	-16777.8 (0.1158)		
$\Delta LIRUS$	15099.4^{*} (0.0618)		
$ECT(-1)$	-0.9919^{**} (0.0209)		
R^2	0.96799		
F – Stat	28.46234 (0.0000)		
Panel B: Diagnostics Test			
Serial Correlation [LM Test: $\chi^2_{(df)}$]			Prob. = 0.0952
Normality Test (Jarque-Bera)			Prob. = 0.5004
Heteroscedasticity (BPG Test)			Prob. = 0.8320
Omitted Variable (Ramsey's RESET)			Prob. = 0.9022

Note: Probability values are given in the parenthesis. *, ** represents the variables are statistically significant at 10 % and 5 % level of significance respectively.

Conclusion and Policy Implications

The both co-integration bound testing approach and the error correction version of ARDL model passes the all the diagnostic test and the stability test. Our results of Wald test imply that long-run (LR) co-integrating relationship exists between the variables. ER has positive and significant impact on BOP in the short run (current value) as well as in the LR while GDP has a negative and significant impact on BOP in the short run (current, lagged 1 and 2) as well as in the LR (It

followed the results of Ahmad et al, 2014; Odili, 2014 and Iyoboyi and Muftan, 2014). Further this model confirms that dependent variable can get back to long run steady state line at the speed of 99.2 % in each year one period after the exogenous shocks. In sum, this study confirms that the exchange rate depreciation improves the BOP (reduce the BOP deficit) of Sri Lanka. Sri Lanka relies on the exchange rate depreciation it can reduce the crisis of expanding BOP deficit. In sum, this study confirms that the exchange rate depreciation improves the BOP (surplus) of Sri Lanka. Sri Lanka relies on the exchange rate depreciation it can reduce the crisis of expanding BOP deficit.

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